DOE/RL-88-21
Grout Treatment Facility
Rev. 7, 12/21/99

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e. 12 character/inch) .

FORM 3	DANGEROUS WASTE PERMIT APPLICATION	I. EPA/STATE I.D. NUMBER
		W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS
		Approved 01/12/00

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete Item below.)*

MO.	DAY	YEAR
03	22	1943

**FOR EXISTING FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left)*
**The date construction of the Hanford Facility commenced.*

☐ 2. NEW FACILITY *(Complete item below)*

MO.	DAY	YEAR

FOR NEW FACILITIES, PROVIDE THE DATE, *(mo., day, & yr.)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT ☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESS - CODES AND CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the (Section III-C).

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	ACRES OR HECTARES
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING SECTION III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

	A. PROCESS	B. PROCESS DESIGN CAPACITY	

LINE NUMBER	CODE *(from list above)*	1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY			
X-1	*S02*	*600*	*G*				
X-2	*T03*	*20*	*E*				
1	T04	382,325	V				
2	T02	382,325	V				
3	S02	3,028	L				
4	T01	4,978	V				
5	D81	22.8	F				
6							
7							
8							
9							
10							

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (CODE "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

T04, T02, S02, T01, D81

The Grout Treatment Facility (GTF)began waste management operation in August 1988. The GTF is designed to treat mixed waste by mixing the liquid waste with grout-forming solids in an in-line mixer (T04), which is part of a unit called the Grout Processing Facility. This process forms a slurry that is pumped to a concrete disposal vault. The vault is operated as a surface impoundment (T02) while the grouted waste slurry hardens. When the slurry material has hardened, the vault is sealed and closed.

The GFT has a total production capacity for treatment of approximately 382,325 liters (101,000 gallons) per day (24-hour period) (T04, T02). Treatment consists of mixing liquid waste with dry cementitious materials. The specific formulation of the dry material is predicated upon the specific constituents resident in the liquid waste stream.

The Liquid Collection Tank (LCT) stores potential mixed waste from any spill or leakage collected in the sumps, spent flush and decomtamination solutions from the internal and external system cleanups, and the excess liquid and leachate pumped back from the vaults (S02). The LCT has a design capacity of 3,028 liters (800 gallons). The dangerous waste is treated in the LCT to make the waste more amenable for storage in the Double-Shell Tank (DST) System (T01). The LCT is capable of treating approximately 4,978 liters (1,315 gallons) per day of dangerous waste.

The GTF vaults have a design capacity of approximately 22.8 hectare-meters (185 acre-feet) consisting of 17.9 hectare-meters (145 acre-feet) of waste and 4.9 hectare-meters (40 acre-feet) of grout material (D81). The GFT could have a total of 43 individual vaults with each indivudual vault having a storage capacity of 0.53 hectare-meters (4.3 acre-feet) [5,299,560 liters (1,400,000 gallons)] of mixed waste.

The technology and process operation of the GTF was demonstrated from August 1988 through July 1989 with the treatment of 3,785,400 liters (1,000,000 gallons) of nondangerous waste. Processing of this waste generated leachate that was a corrosive mixed waste that was stored at the GFT and transferred to the DST System. Per Amendment Four of the Hanford Federal Facility Agreement and Consent Order, the GFT has been placed in a standby mode until other alternatives for processing DST System waste are studied.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER - Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describe the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measuer which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.

3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES				
				1. PROCESS CODES *(enter)*				2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	*K054*	*900*	*P*	*T03*	*D80*			
X-2	*D002*	*400*	*P*	*T03*	*D80*			
X-3	*D001*	*100*	*P*	*T03*	*D80*			
X-4	*D002*			*T03*	*D80*			*included with above*
1	D002	45,359,237	K	T04	T02	S02	T01	Treatment - Other Solidification/Treatment - Surface Impoundment/Storage - Tank/Treatment - Tank
2	D006		↓	↓	↓	↓	↓	↓
3	D007		↓	↓	↓	↓	↓	↓
4	D008		↓	↓	↓	↓	↓	↓
5	D011		↓	↓	↓	↓	↓	↓
6	D029		↓	↓	↓	↓	↓	↓
7	D036		↓	↓	↓	↓	↓	↓
8	D040		↓	↓	↓	↓	↓	↓
9	F001		↓	↓	↓	↓	↓	↓
10	F002		↓	↓	↓	↓	↓	↓
11	F003		↓	↓	↓	↓	↓	↓
12	F005		↓	↓	↓	↓	↓	↓

13	WT01		↓	↓	↓	↓	↓	Included With Above
14	WT02	45,359,237	K	D81				Disposal - Landfill
15								
16								
17								
18								
19								
20								

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The dangerous waste proposed to be treated by the GTF has been determined to have waste characteristics of corrosivity (D002, pH greater than or equal to 12.5). The list of dangerous waste under Section IV.A has been added because of the potential of this waste being treated and stored at the GTF. This dangerous waste consists of toxic constituents cadmium (D006), chromium (D007), lead (D008), silver (D011), 1,1-dichlorethylene (D029), nitrobenzene (D036), trichlorethylene (D040), spent nonhalogenated solvents (F001, F002, F003, and F005), and state-only toxic extremely hazardous waste (WT01) in accordance with the Washington Administrative Code (WAC) 173-303-084 "Dangerous Waste Mixtures." Following the treatment (deactivation and solidification) of the waste for corrosivity, the waste is disposed in vaults and is considered a state -only dangerous waste (WT02) due to toxic characteristics of the waste.

Dangerous waste constituents cadmium (D006) and silver (D011), which are considered toxic characteristic waste, have not been detected in the waste. Process knowledge of the waste being sent to the GTF indicates a strong possibility that these constituents will be in the waste. Chromium (D007) and lead (D008) have been detected in the waste based on the actual analytical data.

The Estimated Annual Quantity of Dangerous Waste of 45,359,237 kilograms (1,000,000 pounds) per year is based on approximately 31,986,630 liters (8,450,000 gallons) of waste, or approximately six vaults. The total filling time of these vaults is estimated to be 84 days per year at a maximum pouring rate of 382,325 liters (101,000 gallons) per day.

If the GTF is activated in the future, a Part A, Form 3, permit application revision could be pursued as required by WAC 173-303 to revise the dangerous waste number(s) and the estimated annual quantity of waste.

V. FACILITY DRAWING **Refer to attached drawing(s).**

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS **Refer to attached photograph(s).**

All existing facilities must include photographs *(arial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION **This information is provided on the attached drawing(s) and photograph(s).**

LATITUDE *(degrees, minutes, & seconds)*					LONGITUDE *(degrees, minutes, & seconds)*				

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

☐ B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*		

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
Keith A. Klein, Manager U.S. Department of Energy	L. L. Piper for	12/21/1999

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

X. OPERATOR CERTIFICATION

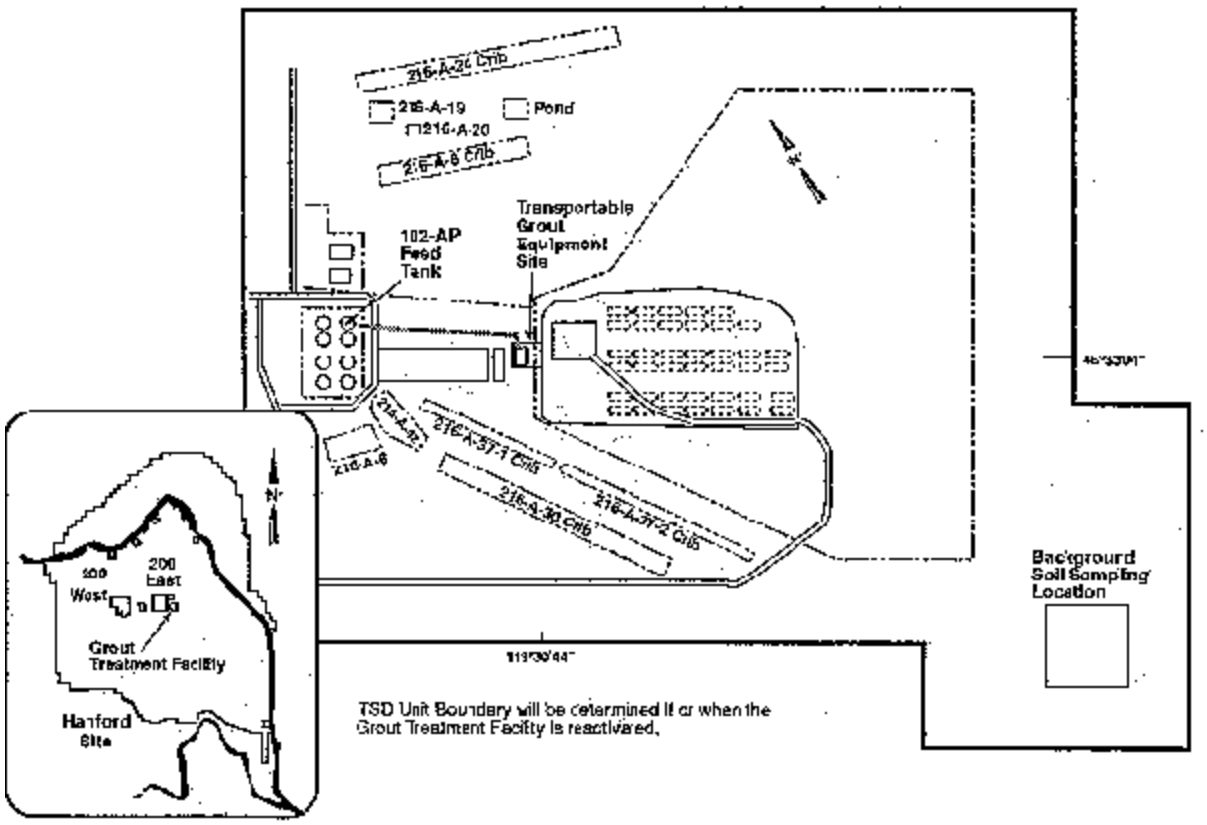
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

L. L. Piper for 12/21/99
Owner/Operator
Keith A. Klein, Manager Date
U.S. Department of Energy

M. P. DeLozier 12/22/99
Co-Operator
M. P. DeLozier Date
President and RPP General Manager
CH2M HILL Hanford Group, Inc.*

*Co-operator under Department of Energy Office of River Protection Contract #DE-AC06-99L14047.

Grout Treatment Facility
Site Plan



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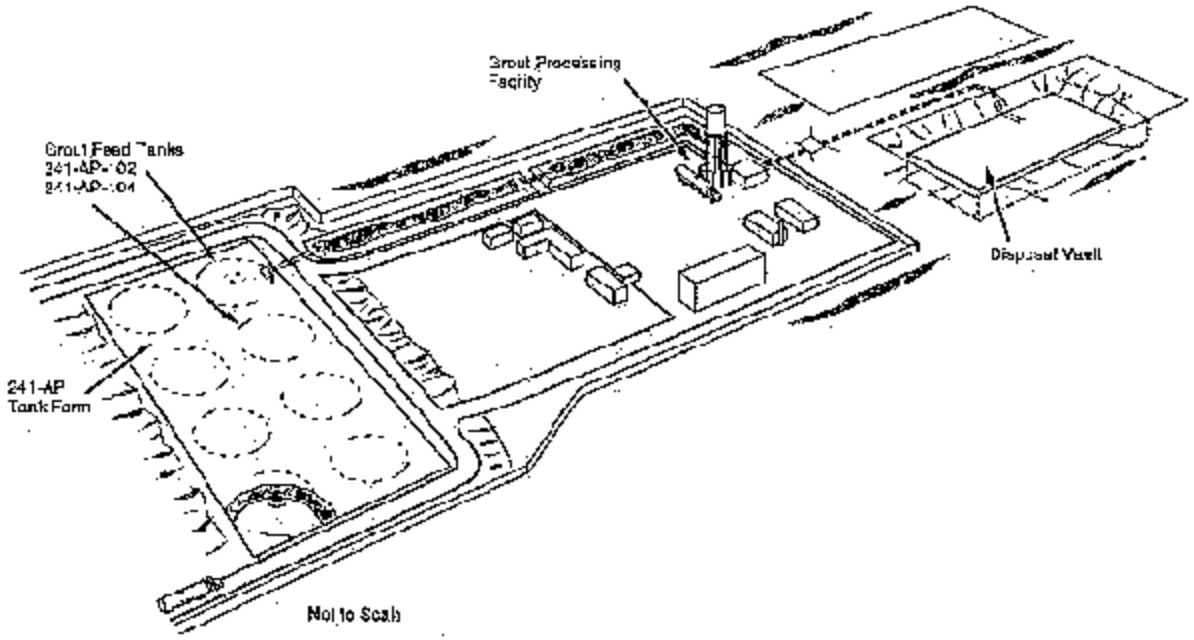
Grout Treatment Facility Layout



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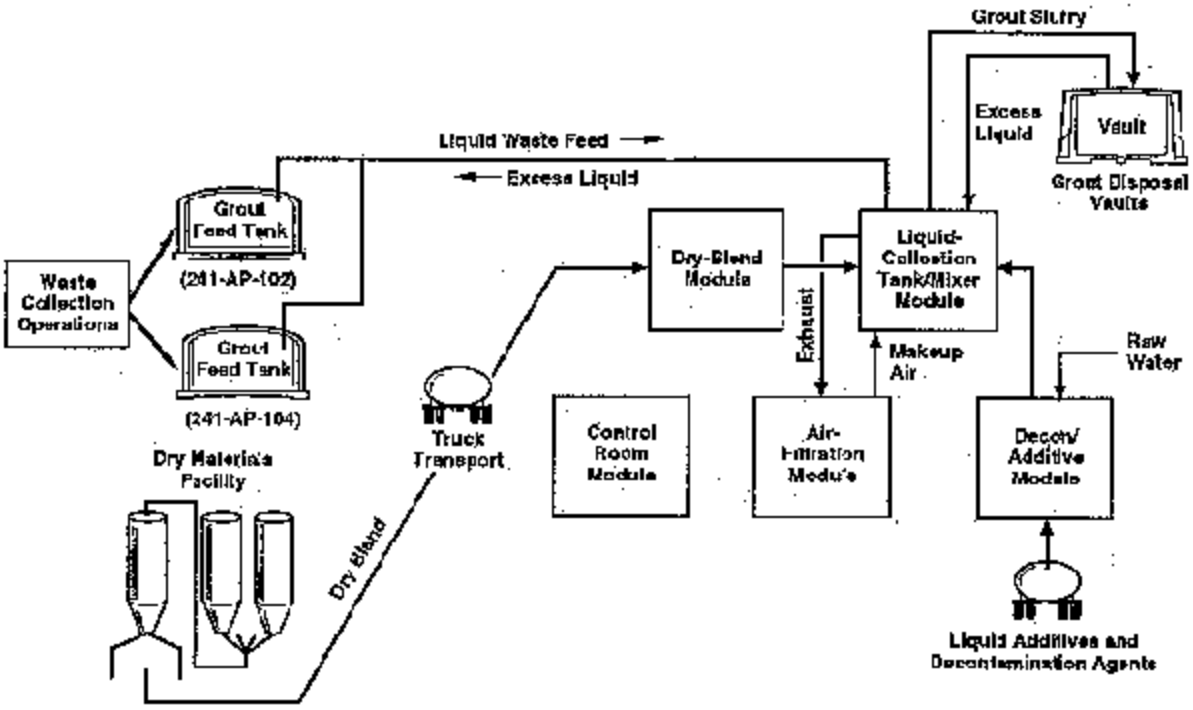
Grout Treatment Facility
Material Flow Diagram



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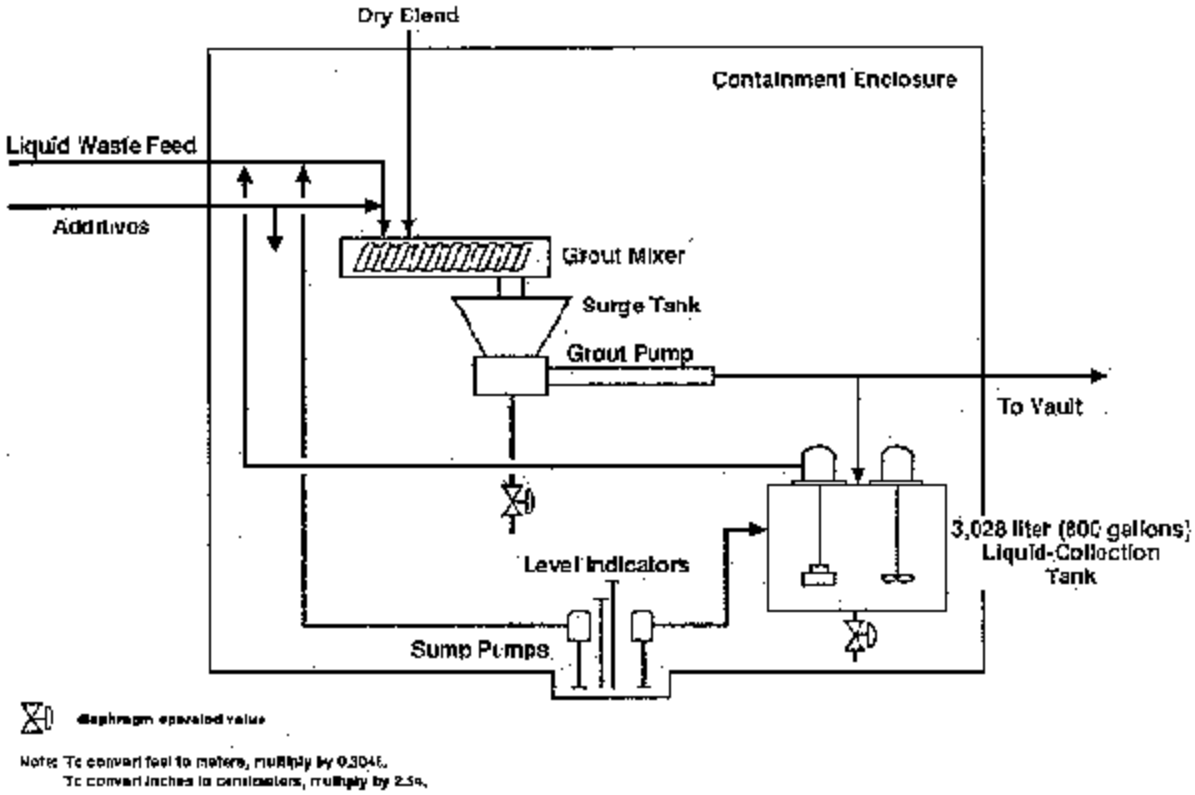
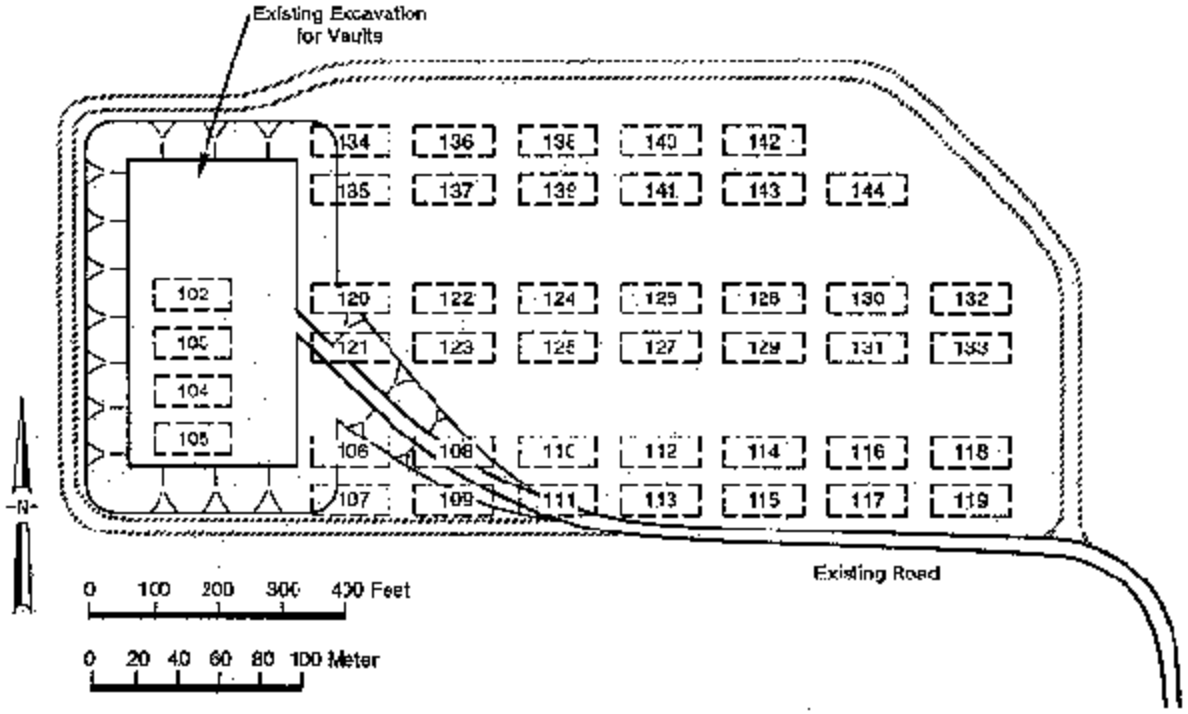
Grout Treatment Facility
Liquid-Collection Tank/Mixer Module

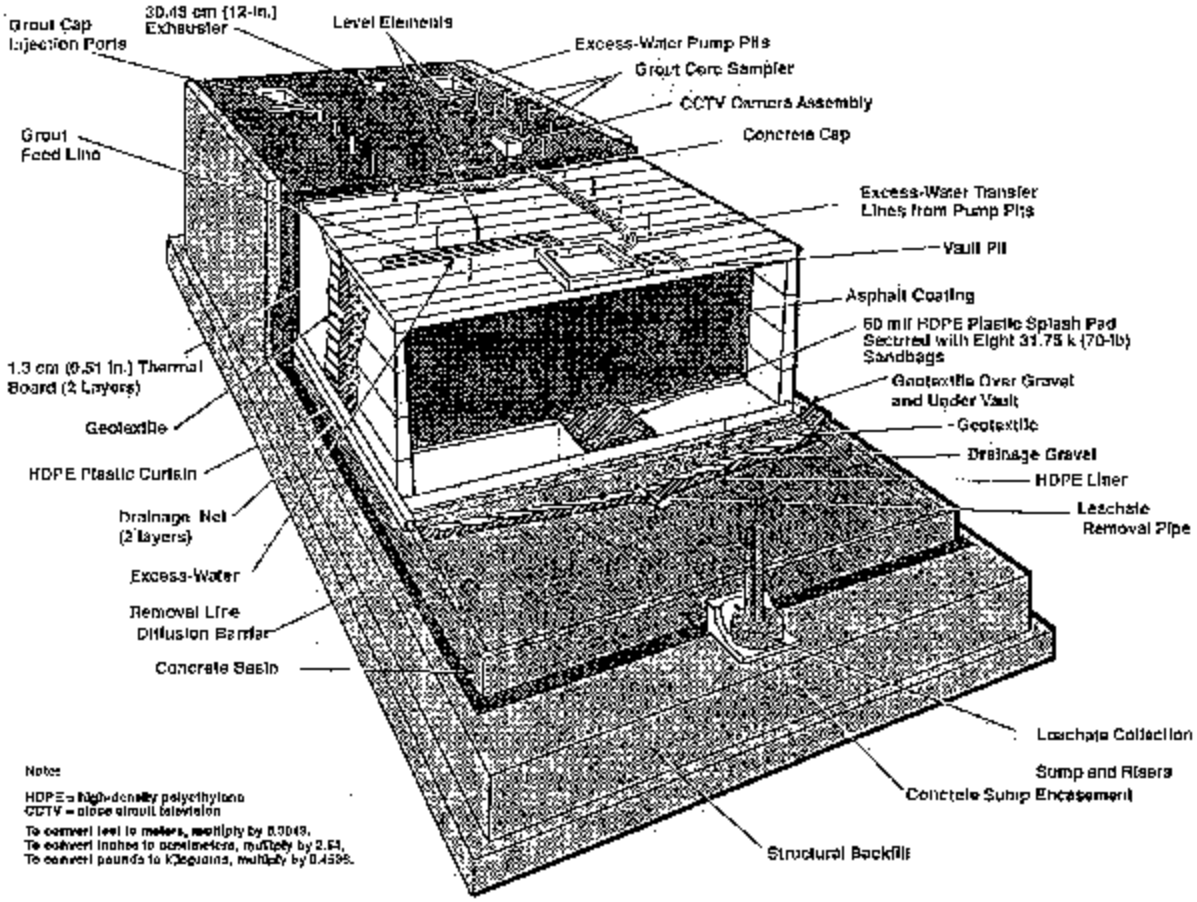


39202084.5

Grout Treatment Facility
Vault Arrangement

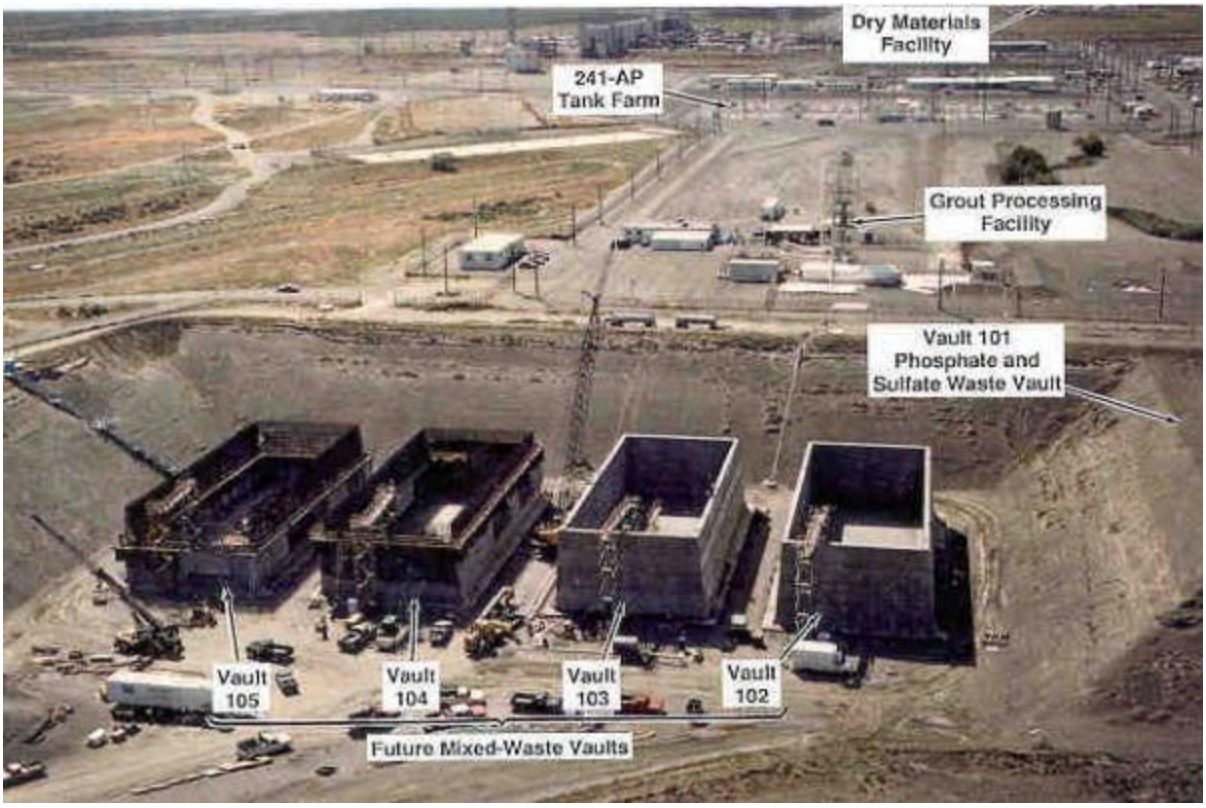


39202084.4


Grout Cap Injection Ports
30.48 cm (12-in.) Exhauster
Level Elements
Excess-Water Pump Pits
Grout Core Sampler
CCTV Camera Assembly
Concrete Cap
Grout Feed Line
Excess-Water Transfer Lines from Pump Pits
Vault Pit
Asphalt Coating
60 mil HDPE Plastic Splash Pad Secured with Eight 31.75 k (70-lb) Sandbags
1.3 cm (0.51 in.) Thermal Board (2 Layers)
Geotextile Over Gravel and Under Vault
Geotextile
Geotextile
Drainage Gravel
HDPE Plastic Curtain
HDPE Liner
Drainage Net (2 layers)
Leachate Removal Pipe
Excess-Water Removal Line
Diffusion Barrier
Concrete Basin
Leachate Collection Sump and Risers
Concrete Sump Encasement
Structural Backfill
Notes:
HDPE = high-density polyethylene
CCTV = close circuit television
To convert feet to meters, multiply by 0.3048.
To convert inches to centimeters, multiply by 2.54.
To convert pounds to kilograms, multiply by 0.4536.

39202084.1

GROUT TREATMENT FACILITY
AERIAL VIEW



46°33'04"
119°30'44"

39202084.2
(PHOTO TAKEN 1991)

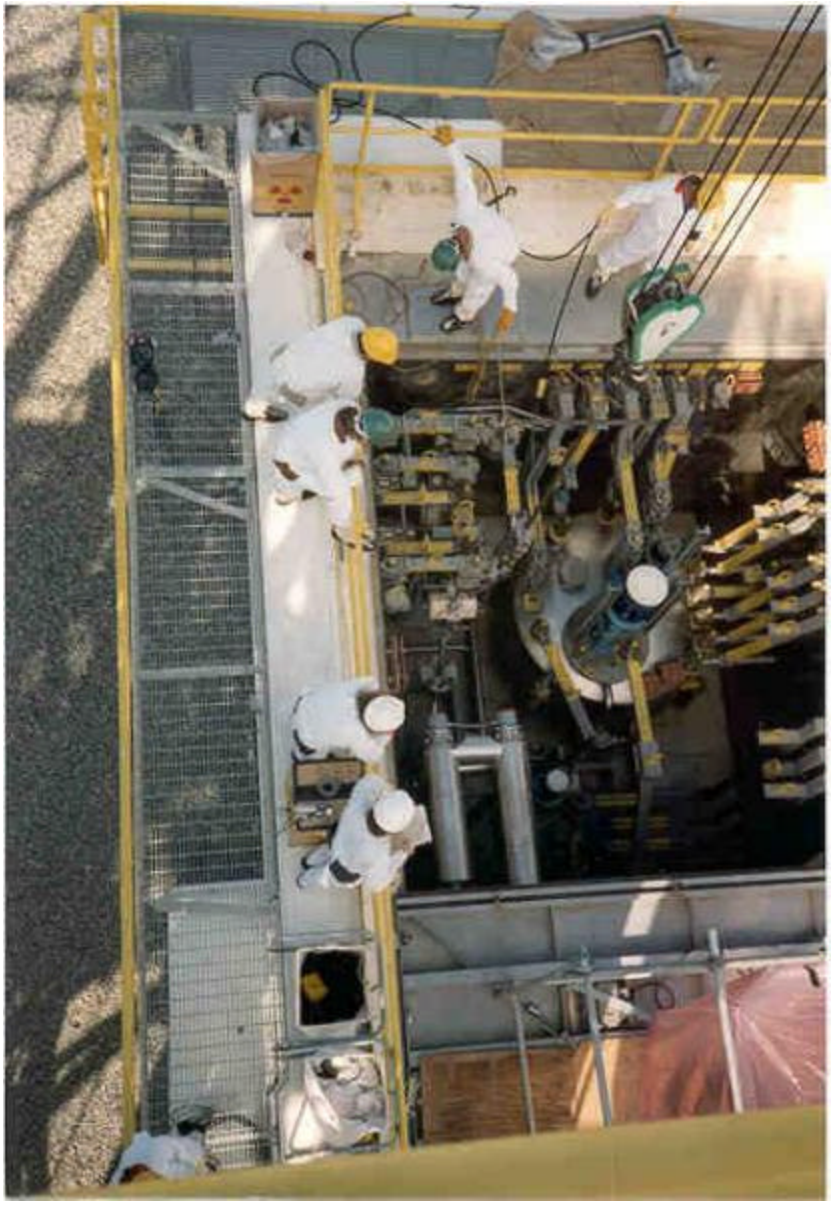
GROUT TREATMENT FACILITY

GROUT PROCESSING FACILITY

46°33'04"
119°30'44"

8802516-9CH
(PHOTO TAKEN 1988)

GROUT TREATMENT FACILITY



LIQUID COLLECTION TANK

46°33'04"
119°30'44"

8800284-1CN
(PHOTO TAKEN 1988)